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EXAMINER	
LAZORCIK, JASON L	
ART UNIT	**PAPER NUMBER**
1791	
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12/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,078	HACK ET AL.	
	Examiner	Art Unit	
	Jason L. Lazorcik	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-13,15,16 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-13,15,16 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants newly added Claim 21 requires in part that the doped glass body consists of silica and one of the listed precursors excluding fluorine. Applicants specification however states that "the dopant may preferably be TiO2. However, the invention can advantageously be also used in the manufacture of silica glass doped with any dopant,..." (pg8, ¶[0023]). It is the Examiners position that the specification as originally filed provides substantially no basis to exclude the use of fluorine as a dopant. Further, the Examiner has found substantially no support for the silica glass composition consisting exclusively of silica and only one of the disclosed list of potential dopants.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 21 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Okamoto et. al. (US 4,358,306).

Okamoto teaches a method for reducing striae in a synthetic silica ingot manufactured in a flame hydrolysis technique. The reference specifically teaches that the "methods of vapor-phase decomposition in a high temperature flame are advantageous when the fused quartz glass formed thereby is desired to be uniformly doped with a controlled amount of a dopant such as germanium, aluminum, iron, boron, phosphorus, zinc, tin, and the like with an object to modify the refractive index or other properties of the fused quartz glass." (Column 1, lines 46-53).

Okamoto further teaches that the produced glass body may be subsequently subject to compression molding at a temperature above the transition temperature. It is evident from the instant reference figure 2 that the thus molded body displays a second formed body having a larger breadth and a smaller height than the original body fabricated by the flame method.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been

obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

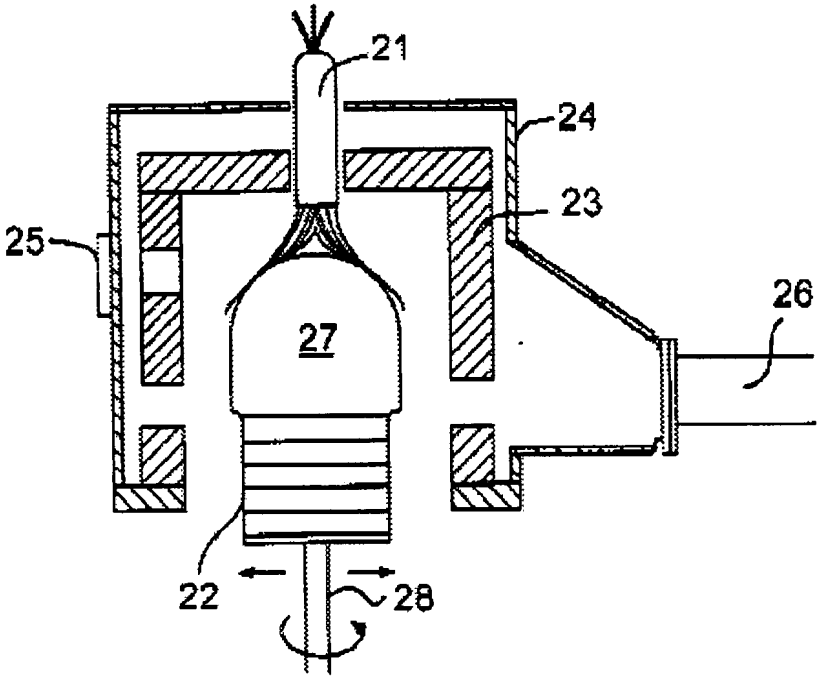
The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3, 5-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jinbo (US 6,473,226 B1) and Okamoto (US 4,358,306) in further view of Berkey (US 4,620,861)

With particular respect to independent **Claim 1**, Jinbo teaches a method for forming a doped silica glass member by flame hydrolysis of precursor materials which presents reduced striae. Specifically, Jinbo teaches a flame hydrolysis method wherein a burner (21) made of silica glass is provided to generate a flame directed on a target (22) (see excerpt figure 2 below). In the figure, the target is "arranged substantially horizontally" with the formed glass body (27) (grown substantially in a vertical direction" (**Claim 12**).

FIG. 2



The reference continues by teaching "an oxygen containing gas and a hydrogen containing gas are expelled from the burner (21) and are mixed to form a flame. A silicon compound, as the material, is diluted with a carrier gas and expelled from the center portion of the burner (21) into the flame thus formed." (Column 5, lines 44-57).

The synthetic silica glass ingot comprising "between about 0.01 wt% and about 0.5 wt %" a fluorine dopant (Column 6, lines 11-13) is formed by flame hydrolysis of the precursor generated from the single burner (21) (**Claim 3,5,6,8,9**). Jinbo teaches that during the deposition the target (22) is rotatably

driven (see figure 2 above) (**Claim 10**) and "pulled down in such a way as to maintain a constant distance from the burner 21 to synthesis surface at the upper part of the ingot" (Column 5, lines 54-57) (**Claim 11**).

With respect to the claimed molding process, the reference discloses that "if after the ingot is synthesized in this or a similar manner, the amount of striae is found to be greater than a permissible value, it is possible to alleviate the strength of the striae through a thermal treatment". To this end, the Jinbo reference teaches heating the ingot higher than the softening point and subjecting the ingot to a press-formation "in such a way as to expand the diameter of the rod". It is the Examiners understanding that this "press-formation" reads directly upon Applicants claimed "reshaping" operation of forming the first glass body into the second body "having a larger breath and a smaller height" (**Claim 4**). Jinbo subsequently teaches (Column 9, lines 5-8) that optical members are cut from the thus formed doped silica ingot in "at least one further reshaping step" (**Claim 16**).

Now, Applicant's claim amendment submitted September 28, 2007 limits the scope of claim 1 to require that "at least titanium is used as a dopant" in the manufacture of the glass body. While Jinobo teaches essentially every element of Applicants claimed glass preform fabrication method (e.g. flame hydrolysis

growth followed by molding preform consolidation), the reference is silent regarding the inclusion of dopant species other than fluorine.

Okamoto teaches a method for reducing striae in a synthetic silica ingot manufactured in a flame hydrolysis technique similar to that disclosed in the Jinbo reference. The reference specifically teaches that the "methods of vapor-phase decomposition in a high temperature flame are advantageous when the fused quartz glass formed thereby is desired to be uniformly doped with a controlled amount of a dopant such as germanium, aluminum, iron, boron, phosphorus, zinc, tin, and the like with an object to modify the refractive index or other properties of the fused quartz glass." (Column 1, lines 46-53).

With respect to **Claim 7**, Jinbo teaches producing a synthetic silica glass ingot comprising "between about 0.01 wt% and about 0.5 wt %" a fluorine dopant (Column 6, lines 11-13). The reference is however silent regarding incorporation of a dopant in a concentration of "at least 1 wt%" as claimed.

In view of the Okamoto teachings and absent any compelling and substantially unexpected results to the contrary, it would have been obvious to one having an ordinary level of skill in the art to incorporate a single or a combination of dopants in the claimed concentration range (e.g. at least 1 wt%) as a means to impart a desired refractive index to the synthetic quartz glass.

Similarly with respect to **claim 15**, Jinbo is silent regarding a preferred material of construction for the target (22).

Okamoto however teaches that the method of forming synthetic silica by flame hydrolysis usually utilizes a "rotating target of quartz glass heated at a temperature higher than the vitrification temperature" (Column 1, Lines 34-35). In view of the Okamoto teachings, it would have been obvious to one of ordinary skill in the art to utilize a silica or quartz disk as the target (22) in the Jinbo flame hydrolysis technique. Further, since one of ordinary skill in the art would recognize that the target (22) would become integrated with the growing silica ingot, it would be a merely obvious extension to match the dopant profile of the target to desired the dopant profile of the growing ingot.

As indicated above, Okamoto teaches fabricating a preform which includes a dopant with a specific objective of modifying the refractive index of the produced fused quartz. The reference explicitly names several conventional dopants which satisify this goal and notes that similar or "like" materials would be recognized by skilled practitioners in the fiber arts (Column 1, lines 46-53). Okamoto is silent regarding the use of titanium as a dopant.

The United States patent to Berkey et. al. (US 4,620,861) discloses a glass preform for the manufacture of optical fibers. In similar fashion to both the Okamoto and Jinbo teachings, Berkey teaches the growth of a glass body by

flame hydrolysis (e.g. fig 2) wherein the silica precursor is co-deposited with at least one dopant from the group comprising titanium (see column 2, lines61-66; column 4, lines 28-54). Berkey further instructs that "Fluorine has also been added along with other dopants in the core of a single-mode fiber to change the zero dispersion wavelength, and it has been added with other dopants to obtain a desired combination of properties such as refractive index and viscosity" (Column 1, lines 27-31).

In view of the foregoing references to Jinbo, Okamoto, and Berkey, it would have been obvious for one of ordinary skill in the art at the time of the invention to utilize titanium and/or fluorine precursors as dopants in the fabrication of a glass body with reduced striae as disclosed by Jinbo. Specifically, Berkey teaches that it is known to add titanium precursors during the flame hydrolysis growth of the preform as a means of tailoring the softening temperature of the fused silica. Likewise, Berkey teaches that it is known to utilize fluorine precursors in the preform in order to tailor the refractive index of the glass body. Further the co-deposition of fluorine and titanium precursors in the Jinbo process would have represented an obvious approach to obtain the "desired combination of properties such as refractive index and viscosity" as taught in the Berkey reference.

In summary, Jinbo teaches a method of fabricating an optical preform by flame hydrolysis of a silica precursor along with a fluorine dopant. The reference

explicitly sets forth essentially every element of Applicants claimed deposition method. Jinobo additionally includes a post growth compaction step wherein the preform is subject to a molding force to "expand the diameter of the rod" in order to reduce striae in the body to a permissible value.

Berkey teaches that in addition to fluorine dopants, titanium precursors may be incorporated to the glass body during the flame hydrolysis growth step as a means for controlling the softening temperature of the grown body. Berkey further teaches that it is known in the art to co-deposit fluorine and titanium precursors in order to achieve a desired combination of refractive index and viscosity in the resultant body.

Okamoto confirms that flame hydrolysis and molding compaction of fluorine doped silica bodies are known in the art of optical fiber preforms. Okamoto further addresses dependent limitations such as the use of a quartz target for flame hydrolysis growth of a doped silica body and the incorporation of dopants in the claimed concentration ranges (note: composition ranges are also addressed by Berkey).

Response to Arguments

Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The newly discovered reference to Edahiro (US 4,975,102) teaches optical fiber preform doping profiles which include inter alia titanium, fluorine, and other species from the list of potential dopants currently claimed in Applicants dependent claim 3. Any response to the instant Official Action should carefully consider the scope and content of this prior art reference. Similarly, the prior art reference to Maxon et. al. (US 5,970,751) teaches the fabrication of a titania doped silica boule by flame hydrolysis wherein it is disclosed that the titanium content may be advantageously adjusted in order to tailor the coefficient of thermal expansion (CTE) for the resultant glass body.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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